DOCUMENT RESUME

ED 267 239 CE 043 774

AUTHOR	Jewell, Larry R.
TITLE	Percent and Percentages. [Student Worksheets for Vocational Agricultural Courses].
INSTITUTION	North Carolina State Univ., Raleigh. Dept. of Occupational Education.
SPONS AGENCY	North Carolina State Dept. of Public Instruction, Raleigh. Div. of Vocational Education.
PUB DATE	85
NOTE	11p.; Product of a Project: "Mathematics Competencies Needed in Selected Vocational Agriculture Program Courses." For related documents, see CE 043 771-780.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Agricultural Education; Computation; High Schools; Learning Activities; Learning Modules; *Mathematical Applications; Mathematical Concepts; Mathematics Skills; *Percentage; Problem Sets; *Problem Solving; Secondary School Mathematics; Test Items; *Vocational Education

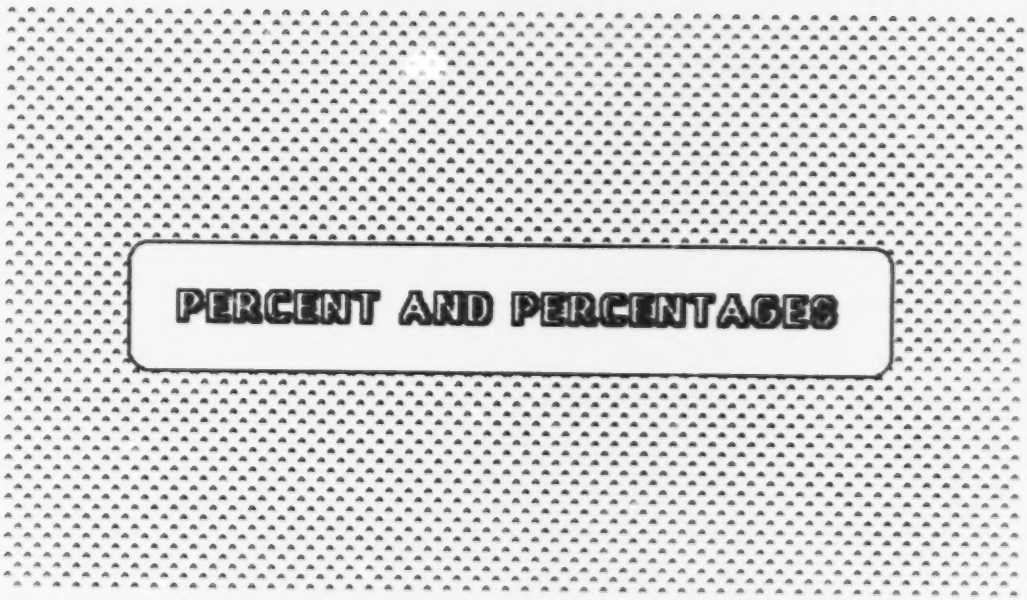
ABSTRACT

This learning module provides students with practice in applying mathematical operations to vocational agriculture. The module consists of unit objectives, definitions, information, problems to solve, worksheets suitable for various levels of vocational agriculture instruction, and answer keys for the problems and worksheets. This module, which covers percents and percentages, provides practice in activities such as changing percentages to decimals and decimals to percents, changing percents to fractions, and solving number sentence percent problems. Practical applications include calculating interest and taxes, finding the proper amount of feed for an animal during a fair, and determining the economic loss caused by insect damage. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

NC8413112

ED267239



U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

E Brumback

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CE043774

Funded under a contract through the Research Coordinating Unit, Division of Vocational Education, Department of Public Instruction, under the auspices of federal law 94-482, FY 1985.

Activities & procedures funded by the Division of Vocational Education are governed by the philosophy of simple fairness to all. Therefore, the policy of the Division is that all operations will be performed without regard to race, sex, color, national origin, or handicap.

TEACHING UNIT: PERCENT AND PERCENTAGES

TRAINING ACTIVIES : 1. Percent sentence problems.

2. Interest and taxes.

UNIT OBJECTIVES :

1. To provide experiences which will enable students to understand the basic concept of percentages.

2. To provide experiences which will enable students to become efficient in the basic computational skills involving percentages.

3. To present arithmetic concepts of working with percentages in a manner keeping with the interests of vocational agriculture students.

DEFINITION : PERCENT - A fraction with 100 as the denominator. The percent symbol (%) is placed to the right of the numerator and replaces the denominator of 100.

RULES FOR WORKING WITH PERCENTS :

1. Changing a decimal to a percent - Move the decimal point two places to the right and attach the percent symbol to the right side of the numerator. This is equivalent to multiplying by 100.

   Example: Change .25 to a percent.
   .25 = 25%

2. Changing a percent to a decimal - Remove the percent sign and move the decimal point two places to the left.

   Example: Change 25% to a decimal.
   25% = .25

3. Mathematical operations such as multiplication and division cannot be performed with the percent sign attached to a number. The percent sign must be removed and the number changed into a decimal or a fraction.

4. Changing a fraction to a pecent - The fraction is first changed to a decimal by dividing the numerator by the denominator. The denominator is then changed to a percent.

   Example: Change 1/4 to a percent.
   1/4 = 1 divided by 4 = .25
   .25 = 25%

5. Changing percents to common fractions - Remove the percent sign and move the decimal two places to the left. Change the decimal to a common fraction having a denominator of 100. Reduce the fraction to lowest terms.

Example: Change 25% to a fraction
25% = 25/100 = 1/4

6. Change a mixed number to a percent - The mixed number is first changed to an improper fraction. The improper fraction is then handled as a regular fraction in that it is changed to a decimal by dividing the numerator by its denominator. The decimal is then changed to a percent.

Example: Change 1 1/4 to a percent
1 1/4 = 5/4 =1.25
1.25 = 125%

7. Change percents to improper fractions or whole numbers - Any percent which is three digits or more can be converted into an improper fraction or whole number by using the same operations used to convert percents to common fractions. Remove the percent sign and move the decimal two places to the left. Change the resulting number to a mixed fraction by making a fraction out of the numbers to the right of the decimal by placing them over 100. Then reduce the fractional portion of the number to its lowest terms.

Example: Change 125% to an improper fraction.
125% = 1.25
1.25 = 1 25/100 = 1 1/4

8. Rules for solving number sentence percent problems - An expression like "what percent of 25 is 5" is often used to state percent problems. Written as a arithmetic statement, the problem would be stated as "y % x 25 = 5" which is an operation involving multiplication, where factor 1 (y % "the percentage") x factor 2 (25 "the base") equals a product (5 "the percent"). Multiplication problems in which both factors or one factor and the product are known can be solved by using the following formulas when:

a = factor 1 (the percentage)
b = factor 2 (the base)
c = product (the percent)

(1) Formula for finding the product (percent); "c" $c = a \times b$

(2) Formula for finding factor 1 (percentage); "a" $a = c/b$

(3) Formula for finding factor 2 (base); "b" $b = c/a$

NAME _____

Percent Sentence Problems

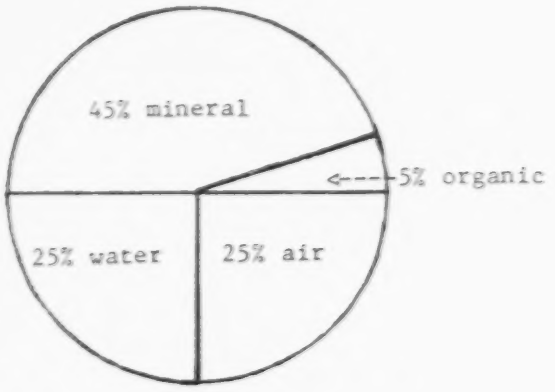
INSTRUCTIONS: Solve the following problems.

1. A farmer has two combines. Combine one has a small grain head which is 12 feet wide and combine two has a small grain head which is 10 feet wide. Percentage wise, how much larger is the head of combine one than combine two? _____ percent.

2. The January feed bill for a chicken operation was $1785. The February bill was 12% higher than the January bill. How much was the February feed bill? _____ dollars.

3. Farmer Jones averaged 89 bushels of corn per acre on her farm last year. This year, her average was 104.13 bushels per acre. What percentage increase did she obtain during the two years?
_____ percent.

4. The list price of a new tractor is $32,879. However, the dealer will give a 12% discount for a cash sale. How much would the tractor cost if purchased with cash?
_____ dollars.



5. The composition of soil is 25% air, 25% water, 45% mineral matter and 5% organic matter. How many pounds of mineral matter would be in one ton (2000 pounds) of soil? _____ pounds.

NAME _____

Interest and Taxes

INSTRUCTIONS: Solve the following problems. Round all dollars amounts to the nearest cent and percents to the nearest hundredth of a percent.

1. A farmer obtains a 1 year, $1000 loan with a simple interest (non-compounding) rate of 15.5%. What was the daily interest charge? (NOTE: 1 year = 365 days.) $ _____.

2. A one year $3000 loan was obtained to purchase fertilizer. The loan had a simple interest rate of 12.75 percent and was paid off in one payment at the end of one year (12 months): (a) What was the total interest charge for the loan? (b) What will be the total cost of the loan (loan principle plus interest)? (a) _____ (b) _____

NOTE AMOUNT	**$ 11,500.00**
INTEREST CHARGE FOR 261 DAYS	**$ 719.54**
ANNUAL SIMPLE INTEREST RATE	**?**

---

3. Find the annual rate of simple interest charged on a $11,500 note that earned $719.54 in 261 days. _____ percent.

4. A custom operator employs a person to help do odd jobs. If the operator pays this person $4.25 an hour, how much social security tax will the person pay in a 40 hour week if the social security rate is $ .068 percent? $ _____.

5. Farmer Jones purchased a roll of wire which cost $41.20 plus tax. If he had to pay 4.5 percent sale tax on the wire, how much would the tax be? $ _____.

6. A new sales representative started to work for an annual salary of $18,500. Assuming that the following are deducted from her pay: 17.8 percent for federal taxes, 8 percent for state taxes and 6.8 percent for social security, how much net pay can the young lady expect each month? $ _____.

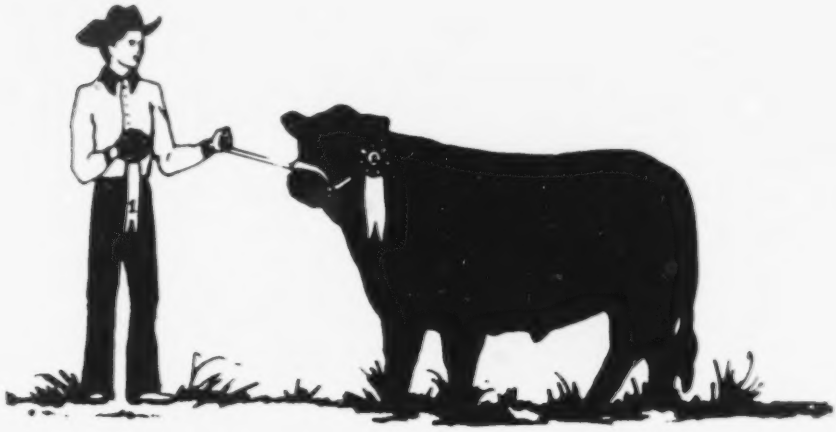
NAME _____

WORKSHEET

COURSE : Agricultural Production I

COMPETENCY : #010 - "Feed and care for animals during a fair"

INSTRUCTIONS : Complete the following problems.



1. Tonya took two beef steers and 300 pounds of feed to the county fair. If she leaves the steers there for 5 days and feeds each 20 pounds of feed per day, what percent of the feed will she use? (*NOTE* : Round to nearest hundredth of a percent.) _____ percent.

2. Susan was in charge of watering the livestock at the fair. It took her 10 minutes to water the chickens, 28 minutes to water the swine, 12 minutes to water the horses, and 22 minutes to water the cattle. What percent of the total watering time was spent watering the horses?
_____ percent.

3. Michael spent 3 hours per day caring for his two beef steers at the fair. Of this, he spent 20 minutes per day grooming. What percent of the total time devoted to caring for the steers was spent on grooming?
_____ percent.

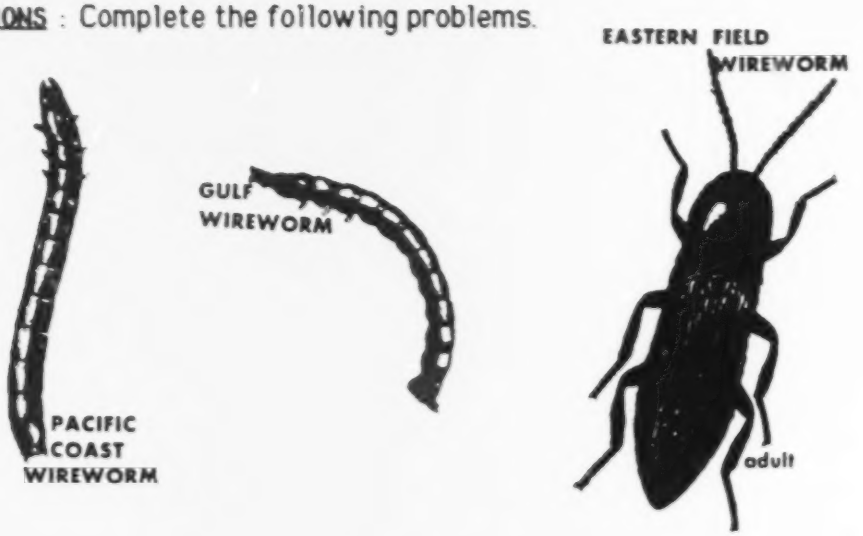
NAME_____

WORKSHEET

COURSE: **Agricultural Production II**

COMPETENCY: #011 - "Determine the economic loss due to insect damage"

INSTRUCTIONS: Complete the following problems.



1. Farmers in the Angier community raised 2300 acres of corn in 1983. If wireworms destroyed 7% of the harvestable crop, how many acres of corn were lost due to wireworm damage?

_____ acres.

2. If the harvested corn averaged 115 bushels per acre, how many total bushels were lost due to wireworm damage?

_____ bushels.

3. If the average price received per bushel of corn was $3.11, how much money did the farmers lose due to wireworm damage?

$ _____ .

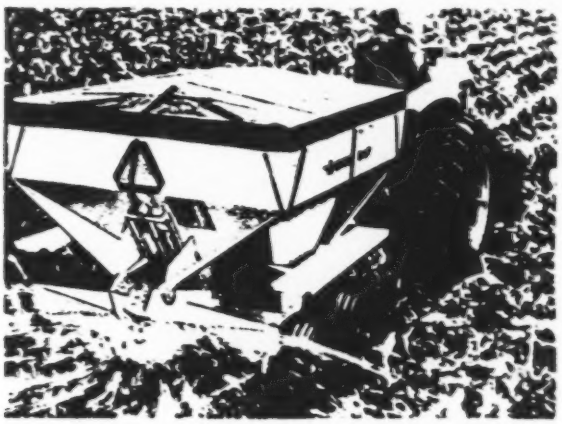
NAME _____

WORKSHEET

COURSE : Agricultural Production I

COMPETENCY : #016 - "Calculate in units per acre the nutrients required for a specified crop"

INSTRUCTIONS : Complete the following problems.



1. Farmer Smith applied 1000 pounds of fertilizer to five acres of corn. How many pounds did he apply per acre? _____ pounds.

2. If the 1000 pounds of fertilizer applied to the corn deposited twenty pounds of Nitrogen (N) per acre, what percentage of the fertilizer was Nitrogen? _____ percent.

3. If the 1000 pounds of fertilizer applied to the corn deposited sixteen pounds of Phosphorus (P) per acre, what percentage of the fertilizer was Phosphorus? _____ percent.

4. If the 1000 pounds of fertilizer applied to the corn deposited eighteen pounds of Potassium (K) per acre, what percentage of the fertilizer was Potassium? _____ percent.

5. How many pounds of N - P - K were in the 1000 pounds of fertilizer used by Farmer Smith? _____ pounds.

ANSWER KEY FOR MODULE TITLED "PERCENT AND PERCENTAGES"

Module Training Unit (percent sentence problems):

(1.) 20 (2.) $1,999.20 (3.) 17 (4.) $28,933.52 (5.) 900

Module Training Unit (Interest and Taxes):

(1.) $ 0.42 (2a.) $ 382.50 (2b.) $3,382.50 (3.) 8.75
(4.) $ 11.56 (5.) $ 1.85 (6.) $1039.08

Competency #010 Worksheet:

(1.) 66.67 (2.) 16.67 (3.) 11.11

Competency #011 Worksheet:

(1.) 161 (2.) 18,515 (3.) $ 57,581.65

Competency #016 Worksheet:

(1.) 200 (2.) 10 (3.) 8 (4.) 9 (5.) 270